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REPORT
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NATIONAL SCIENCE FOUNDATION AUTHORIZATION ACT OF 1987

AUGUST 7 (legislative day, AUGUST 5), 1987.—Ordered to be printed

Mr. KENNEDY, from the Committee on Labor and Human Resources, submitted the following

REPORT

[To accompany S. 1632]

The Committee on Labor and Human Resources, having considered an original bill (S. 1632) to authorize appropriations for the National Science Foundation for fiscal years 1988 through 1992, reports favorably thereon, and recommends that the bill do pass.

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I. BRIEF SUMMARY

The bill authorizes appropriations for the National Science Foundation for fiscal years 1987 through 1922 as follows:

I. Research and Related Activities, U.S. Antarctic Program and Science and Engineering Education:

Fiscal year 1988:

Biological, Behavioral and Social Sciences	[1] $297,000,000
Computer and Information Science and Engineering	[1] 143,000,000
Engineering	[1] 205,000,000
Geosciences	[1] 330,000,000
Mathematical and Physical Sciences	[1] 514,000,000
Scientific, Technological and International Affairs	[1] 51,000,000

S543-17.

Program Development and Management	95,000,000
Science and Engineering Education—10,000,000[2]	[3] 115,000,000
United States Antarctic Program	143,000,000
Total	[3] 1,893,000,000
Fiscal year 1989	2,158,000,000
Fiscal year 1990	2,474,000,000
Fiscal year 1991	"such sums as necessary"
Fiscal year 1992	"such sums as necessary"

II. Research Facilities Revitalization:

Fiscal year 1988	[4] up to $1,000,000
Fiscal year 1989	47,000,000
Fiscal year 1990	95,000,000
Fiscal year 1991	"such sums as necessary"
Fiscal year 1992	"such sums as necessary"

[1] $10,000,000 shall be transferred from these categories to Science and Engineering Education.
[2] Transferred from labelled categories ([1]).
[3] May be reduced by up to $1,000,000 for Facilities Program Establishment.
[4] Transferred from labelled categories ([3]).

II. Background and Need for Legislation

The National Science Foundation (NSF) is an independent federal agency established by the National Science Foundation Act of 1950 (P.L. 81-507) to promote and advance scientific progress in the United States, through scientific research and education. The concept of a National Science Foundation was an outgrowth of the important contributions made by science and technology during the Second World War. Since its establishment in 1950, NSF has occupied a unique place among federal government agencies, with responsibility for the overall health of basic science across all disciplines, in contract to other agencies that support research directed to specific missions.

NSF maintains U.S. scientific strength by funding research in all fields of science and engineering through grants and contracts to more than 2,000 colleges and universities and other research institutions in all parts of the United States. Although the National Science Foundation receives less than 3 percent of the total federal R&D budget, the foundation accounts for about 28 percent of federal support for basic research going to the Nation's colleges and universities.

NSF receives over 36,000 unsolicited proposals each year for research and graduate fellowships and makes over 14,000 awards. The awards go to universities, colleges, university consortia, not-for-profit institutions, and small businesses. NSF operates no in-house laboratories, but does support the operation of National Research Centers, oceanographic research vessels, and Antarctic research stations. The Foundation also supports cooperative research efforts by universities and industry, and U.S. participation in mutually beneficial programs of international scientific cooperation. Except for administration costs, funds appropriated to the Foundation by the Congress go to non-federal science and engineering research and education activities.

Foundation staff is assisted by formal advisory committees and ad hoc reviewers of research proposals. This advisory system, which provides advice both on program direction and on specific proposals, involves more than 50,000 scientists and engineers each year. NSF staff members—who are experts in science or engineering—make final award decisions. Applicants receive verbatim unsigned copies of peer reviews and can appeal award decisions through a formal mechanism.

A 25-member National Science Board with includes the Director of NSF ex officio, establishes policies for the Foundation, within the framework of applicable policies made by the President and the Congress. The Board, the Director of the Foundation, and the Deputy Director are appointed by the President with the advice and consent of the Senate; seven Assistant Directors are appointed by the Director.

By establishing NSF in 1950, the Congress recognized that support of long-term fundamental research in all fields of science and engineering, and the teaching and learning of science contribute to the strength and well-being of the Nation in many ways. In fact, technological innovation achieved through research has been responsible for nearly half of all productivity gains since World War II. Research results can take their place side by side with economies of scale and other productivity enhancement parameters.

Many of NSF's past and current programs can be directly tied to these productivity gains: robotics, computer technologies, biotechnology, and many more. Seeking productivity through research and technological innovation is one way the U.S. should enhance its positions in international and economic competitiveness.

III. Text of the Bill as Reported

SHORT TITLE

Section 1. This Act may be cited as the "National Science Foundation Authorization Act of 1987".

TITLE I—NATIONAL SCIENCE FOUNDATION AUTHORIZATIONS

AUTHORIZATION OF APPROPRIATIONS

Sec. 101. (a) Finding.—The Congress finds that to strengthen national economic productivity and competitiveness the programs of the National Science Foundation should be adequately funded.

(b) Authorizations.—There is authorized to be appropriated to the National Science Fondation:

(1) For the fiscal year 1988, $1,893,000,000. Such funds shall be available for the following categories:

(A) Biological, Behavioral, and Social Sciences, $297,000,000.

(B) Computer and Information Science and Engineering, $143,000,000.

(C) Engineering $205,000,000.

(D) Geosciences, $330,000,000.

(E) Mathematical and Physical Sciences, $514,000,000.

(F) Scientific, Technological, and International Affairs, $51,000,000.

(G) Program Development and Management, $95,000,000.

(H) Science and Engineering Education, $115,000,000, of which $73,000,000 shall be available for precollege programs and $14,500,000 shall be available for College Science Instrumentation.

(I) United States Antarctic Program, $143,000,000.

(2) For the fiscal year 1989, $2,158,000,000.

(3) For the fiscal year 1990, $2,474,000,000.

(4) For the fiscal year 1991 such sums as may be necessary.

(5) For the fiscal year 1992 such sums as may be necessary.

(c) SPECIAL RULES.—(1) Notwithstanding any other provision of this Act, from the amounts set forth in categories (A) through (F) of subsection (b)(1), $10,000,000 shall be transferred to category (H) of subsection (b)(1), relating to Science and Engineering Education.

(2) Notwithstanding any other provision in this Act, of the amounts authorized in subsections (b)(2) through (b)(5), the amounts available for Science and Engineering Education for each such year shall be increased by a percentage that is at least equal to the percentage by which the aggregate amount available for the categories set forth in subparagraphs (A) through (G) of subsection (b)(1) for such year exceeds such amount for the previous fiscal year.

AVAILABILITY OF APPROPRIATIONS

SEC. 102. Appropriations made under authority provided in section 101 shall remain available for obligation for periods specified in the Acts making the appropriations.

CONSULTATION AND REPRESENTATION EXPENSES

SEC. 103. From appropriations made under authorizations provided in this Act, not more than $7,500 may be used in each fiscal year for official consultation, representation, or other extraordinary expenses at the discretion of the Director of the Foundation. The determination of the Director will be final and conclusive upon the accounting officers of the Government.

TRANSFER OF FUNDS

SEC. 104. (a) GENERAL RULE.—Funds may be transferred among the categories listed in section 101, so long as the net funds transferred to or from any category do not exceed 10 per centum of the amount authorized for that category in section 101.

(b) SPECIAL RULE.—In addition, the Director of the Foundation may propose transfers to or from any category exceeding 10 per centum of the amount authorized for that category in section 101. An explanation of any such proposed transfer must be transmitted in writing to the Committee on Science, Space, and Technology of the House of Representatives, and the Committees on Labor and Human Resources and Commerce, Science, and Transportation of the Senate. The proposed transfer may be made only when 30 calendar days have passed after transmission of such written explanation.

ADMINISTRATIVE AMENDMENTS

SEC. 105. (a) BOARD MEETINGS.—Section 4 of the National Science Foundation Act of 1950 (42 U.S.C. 1863) is amended by adding at the end thereof the following:

"(k) Portions of Board meetings in which the Board considers proposed Foundation budgets for a particular fiscal year may be closed to the public until the President's budget for that fiscal year has been submitted to the Congress.".

(b) EXECUTIVE COMMITTEE.—Section 7 of the National Science Foundation Act of 1950 is amended to read as follows:

"EXECUTIVE COMMITTEE

"SEC. 7.—The Executive Committee of the Board shall be composed of the Director ex officio, who shall chair the Committee, and at least four other Board members elected by the Board. The Executive Committee shall exercise such powers and functions as may be delegated to it by the Board.".

(c) REPEAL.—Subsection 15(c) of the National Science Foundation Act of 1950 is repealed.

(d) COMMITTEE ON EQUAL OPPORTUNITIES IN SCIENCE AND ENGINEERING.—(1) Section 36(b) of the National Science Foundation Authorization and Science and Engineering Equal Opportunities Act (42 U.S.C. 1885 to 1885d) is amended to read as follows:

"(b) Each member of the Committee shall be appointed by the Director of the National Science Foundation. Members shall be appointed to serve for a three-year term, and may be reappointed for an additional term of three years.".

(2) Section 36(f) of such Act is amended to read as follows:

"(f) Every two years, the Committee shall prepare and transmit to the Director a report on its activities during the previous two years and proposed activities for the next two years. The Director shall transmit to Congress the report, unaltered, together with such comments as the Director deems appropriate.".

TITLE II—UNIVERSITY RESEARCH FACILITIES REVITALIZATION

SHORT TITLE

SEC. 201. This title may be cited as the "University Research Facilities Revitalization Act of 1987".

FINDINGS

SEC. 202. The Congress finds that—

(1) the fundamental research and related education programs supported by the Federal Government and conducted by the Nation's universities and colleges are essential to our national security, and to our health, economic welfare, and general well-being;

(2) many national research and related education programs conducted by universities and colleges are not hindered by obsolete research buildings and equipment, and many institutions lack sufficient resources to repair, renovate, or replace their laboratories;

(3) the Nation's capacity to conduct high-quality research and education programs and to maintain its competitive position at the forefront of modern science, engineering, and technology is threatened by this research capital deficit, which poses serious and adverse consequences to our future national security, health, welfare, and ability to compete in the international marketplace;

(4) a national effort to spur reinvestment in research facilities is needed, and national, State, and local policies and cooperative programs are required that will yield maximum return on the investment of scarce national resources and sustain a commitment to excellence in research and education; and

(5) the National Science Foundation, as part of its responsibility for maintaining the vitality of the Nation's academic research, and in partnership with the States, industry, and universities and colleges, must assist in enhancing the historic linkages between Federal investment in academic research and training and investment in the research capital base by reinvesting in the capital facilities which modern research and eduation programs require.

PURPOSE; ESTABLISHMENT OF UNIVERSITY RESEARCH LABORATORY MODERNIZATION PROGRAM

SEC. 203. (a) PURPOSE.—It is the purpose of this title to assist in revitalizing the Nation's academic research programs through capital investments in laboratories and other research facilities at universities and colleges and independent nonprofit research institutes.

(b) ESTABLISHMENT OF PROGRAM.—To carry out this purpose, the National Science Foundation shall establish and carry out a new university research laboratory modernization program, under which awards are made to institutions of higher education and independent nonprofit research institutes for the repair, renovation, or replacement (as appropriate) of such institutions' obsolete laboratories and other research facilities.

(c) PROJECTS AND FUNDING.—The university research laboratory modernization program established by the National Science Foundation pursuant to subsection (b) shall be carried out, through projects which involve the repair, renovation, or replacement (as appropriate) of specific research facilities at the universities and colleges and independent nonprofit research institutes involved and for which funds are awarded in response to specific proposals submitted by such universities and colleges and institutes, in accordance with regulations prescribed by the Director of the Foundation with the objective of carrying out the purpose of this title. The regulations so prescribed shall contain such terms, conditions, and guidelines as may be necessary in the light of that objective, but shall in any event provide that funds to carry out the program will be awarded to any university or college or independent nonprofit research institute only on the basis of merit after a comprehensive review using established Foundation procedures, and that the funds so awarded to any university or college or institute will be in an amount not exceeding 50 percent of the cost of the repair, ren-

ovation, or replacement involved (with the funds required to meet the remainder of such cost being provided by the institution involved or from other non-Federal public or private sources).

(d) CRITERIA FOR AWARDS.—Criteria for the award of funds to any institution for a project under the university research laboratory modernization program established pursuant to subsection (b) shall include—

(1) the quality of the research and training to be carried out in the facility or facilities involved;

(2) the congruence of the institution's research activities with the future research needs of the Nation and the research mission of the National Science Foundation;

(3) the contribution which the project will make toward meeting national, regional, State, and institutional research and related training needs; and

(4) an anlaysis of the age and condition of existing research facilities and equipment.

CONSULTATIONS REQUIRED

SEC. 204. In prescribing regulations and conducting the program authorized by this title, the Director of the National Science Foundation shall consult with other agencies of the Federal Government concerned with research, including the Department of Education, the Department of Health and Human Services, the National Aeronautics and Space Administration, the Department of Energy, the Department of Agriculture, and the Department of Defense.

PLANNING ACTIVITIES

SEC. 205. (a) GENERAL AUTHORITY.—The Director of the National Science Foundation shall conduct comprehensive planning activities necessary to implement the university research laboratory modernization program authorized by this title.

(b) STUDY ON RESPONSIBILITIES FOR SUPPORT OF RESEARCH FACILITIES.—(1) The Director of the Foundation, after consultation with other appropriate Federal agencies, institutions of higher education, State and local governments and appropriate nonprofit organizations shall conduct a comprehensive study to define the appropriate roles and responsibilities of the Federal Government, institutions of higher education, State and local governments and appropriate nonprofit organizations.

(2) The Director of the Foundation shall prepare and submit a report of the study required by paragraph (1) of this subsection to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Labor and Human Resources and the Committee on Commerce, Science, and Transportation of the Senate not later than March 1, 1988.

(c) AVAILABILITY OF FUNDS.—The Director from amounts available to the Foundation in any category described in section 101(b)(1) for fiscal year 1988, may make available an amount, but not to exceed $1,000,000, to carry out the provision of this section.

AUTHORIZATION OF APPROPRIATIONS

SEC. 206. (a) IN GENERAL.—There are authorized to be appropriated to the National Science Foundation $47,000,000 for fiscal year 1989, $95,000,000 for fiscal year 1990, and such sums as may be necessary for each of the fiscal years 1991 and 1992, for carrying out the new university research laboratory modernization program established by the Foundation pursuant to section 203(b) of this title.

(b) EQUALIZATION SET-ASIDE FOR CERTAIN TYPES OF INSTITUTIONS.—(1) At least 15 percent of the amount which is appropriated pursuant to subsection (a) to carry out the Foundation's university research laboratory modernization program in any fiscal year shall be available only for awards to institutions of higher education that received less than $10,000,000 in total Federal obligations for research and development (including obligations for the university research laboratory modernization program) in each of the two preceding fiscal years.

(2) Of the amounts appropriated under subsection (b)(1) of this section in each fiscal year, at least 10 percent of the funds shall be reserved for institutions of higher education serving a substantial number of minority and disadvantaged undergraduate and graduate students.

IV. COMMITTEE VIEWS

The Committee recognizes the importance of science and technology in strengthening U.S. productivity and economic competitiveness. Increasing funding for basic research should help preserve our lead in science, engineering, and technology, so that our industries can remain competitive internationally, while maintaining our standard of living at home. The science and engineering research and educational programs supported by the National Science Foundation are vital to maintaining our nation's leading position in the future. The Committee also recognizes that the these programs require long-range planning and assurance of direction and support. Therefore, to provide the NSF with clear direction and to enable the Foundation to plan and initiate long-term programs, the Committee supports a five year reauthorization of the NSF.

The Committee recommends an authorization of $1,893,000,000 for FY 1988. This is an increase of $268.6 million or 16.5 percent over the FY 1987 budget plan. This represents the same level of funding requested by the Administration in its budget submission and is consistent with the Senate-passed budget resolution. For research and related activities, science and engineering education, and the U.S. Antartic program, the Committee authorizes $2,158,000,000 and $2,474,000,000 for FY 89 and FY 90 respectively. The amounts for FY 91 and FY 92 will be determined by assessment of the programs, with the understanding that the overall budget for the Foundation will at least double within this five year period. These amounts are the same levels requested by the President. The Committee applauds the Administration's commitment to double NSF's budget by 1992, but recognizes that interim assessment of the needs and success of the NSF programs may warrant doubling of this budget in less than five years. Therefore, for FY 91

and FY 92, the Committee authorizes "such sums as may be necessary".

The Committee strongly supports NSF funding increases in the area of education and human resources. The future of U.S. science, engineering and technology is dependent on highly trained scientists and engineers. Numerous reports, including the White House Science Council, the National Science Board, and the American Council on Education have identified serious problems with the quality and size of the science and engineering talent pool. The trend of declining numbers of U.S. students pursuing careers in science and engineering must be reversed. For FY 1988, the Foundation proposal to spend $273 million in the area of education and human resources has been increased to $283 million, and the need to maintain emphasis in this area in the future is stressed.

The Committee endorses NSF's expansion of its centers program and will be following their establishment and effectiveness with interest. However, the development and expansion of the centers concept should not undermine NSF's primary responsibility of funding individual investigator-initiated research. The overall plan for the centers initiative should continue to be reviewed as the success of the established centers is determined.

The Committee notes the issuance of Executive Order 12591, "Facilitating Access to Science and Technology." In particular, Section 6 of the order encourages the heads of each department and agency to examine the potential for the establishment of science and technology centers that would focus on areas of fundamental research and technology that are both scientifically promising and have the potential to contribute to the Nation's long-term economic competitiveness. The Committee welcomes the initiation of additional research centers under the following conditions: a) the creation of additional science and technology centers should not dramatically shift the current mix of federal research support away from the individual investigator; and b) the establishment of additional centers by other agencies should in no way detract from the research center programs supported by the Foundation.

As already noted, the Committee intends that the Foundation should double its budget over the next five years. The growth of the Foundation should involve initiatives in both the center mode of support as well as the individual investigator. Efforts made by other federal agencies, along with the enactment of necessary authorizing legislation, are welcomed and encouraged. However, the Committee views these additional efforts as complimentary and in addition to the innovative approaches proposed by the Foundation and to which the Committee attaches a high priority.

In addition to increased support for research and manpower, the committee recognizes the critical need to maintain university research facilities. The state of institutions' facilities is an integral component in their ability to carry out the overall mission of NSF. Therefore, the Committee has reestablished a role for NSF in the revitalization of university research facilities. Following a comprehensive study, planning and establishment of the program, funds are authorized for the revitalization of university research facilities.

MATHEMATICAL AND PHYSICAL SCIENCE (MPS)

The Committee recommends $514 million for fiscal year 1988. This represents an increase of 10.7 percent or $49.8 million more than the FY 1987 current plan. The FY 1988 program maintains research across the MPS disciplines, supports special instrumentation, university research laboratories, and national user facilities. Support is focused on colleges and universities because they combine forefront research with advanced training of graduate students. Except for mathematics, MPS disciplines involve experimental and observational research and, therefore, an adequate instrumental capability is paramount. Consequently, support for R&D associated with the development of new instrumentation is increased by $12.9 million, an increase of almost 50 percent.

Support for Mathematical Sciences will increase nearly 40 percent between FY 1985 and FY 1988. Much of this increase is an attempt to deal with major structural problems documented initially in the 1984 report from the National Research Council entitled, "Renewing U.S. Mathematics: Critical Resource for the Future." The Foundation's proposal to support efforts to revise the calculus curriculum, and the increases in availability of fellowships for graduate students, as well as junior and senior investigators is applauded by the Committee.

Astronomical Sciences will be funded at $92.56 million, an increase of 8.8 percent. The astronomical sciences supports ground-based research in all areas of astronomy. Current support activities provides for a balanced program, particularly with respect to observational and theoretical studies, and also to wavelength coverage. Funds for construction of the Very Long Baseline Array have been increased by $2.0 million to cut construction time and reduce project costs. The Committee expects NSF to promote and participate in the proposed International Space Year in 1992, including support of International Space Year activities through the National Academy of Sciences and at universities.

The Physics subactivity will continue to support completion of large facilities upgrades such as the Cornell Electron Storage Ring and the National Superconducting Cyclotron Lab at Michigan State University. In the area of elementary particle physics and nuclear physics, NSF provides 8 percent and 20 percent of all Federal support respectively. In the academic arena, this represents 34 percent and 50 percent of all academic research in elementary particle physics and nuclear physics respectively.

In Chemistry, the Foundation is initiating a substantive response to the 1985 National Research Council report, "Opportunities In Chemistry," with priorities in a) understanding chemical reactivity; b) chemical catalysis; c) chemistry of life processes; d) chemistry around us; and e) chemical behavior under extreme conditions.

The Materials Research initiatives will receive increased support. Among the advances which have resulted from Materials Research are the new superconducting materials. The Committee looks forward to advances in this field. Materials research will expand the Materials Research Group Program and the Foundation will begin a materials processing initiative jointly with the Engineering Activity.

ENGINEERING (ENG)

The Committee recommends $205 million, an increase of 26 percent over the FY 1987 plan of $163 million.

A large portion of this increase ($18 million) is for the Engineering Research Centers (ERC) program, which supports cross-disciplinary basic research and education. The goal of the ERC's is to develop fundamental knowledge in leading and emerging, and particularly inter-disciplinary, engineering fields that are important to improving the Nation's economic competitiveness, and to prepare engineers to contribute through better engineering practice. Some of the topics appropriate for consideration in the ERC program could include: design and manufacturing, advanced materials processing, surface and interfacial technology, resource recovery and utilization, biotechnology, bioengineering, neuroengineering, lightwave technology and optoelectronic mechanical devices and systems.

The Committee emphasizes that the educational component of the ERC program is an important aspect and should not be deemphasized. In addition the Committee suggests that NSF explore ways to use the ERC's in innovative ways with nearby institutions to strengthen engineering research and education on a regional basis. The Committee also suggests the NSF seek the involvement of other Federal agencies as well as the National Laboratories in the support of the engineering research centers on relevant topics.

Although the Committee encourages broad participation in the ERC's including private for-profit companies, the Committee reemphasizes the role of the NSF in basic scientific and engineering research and education. The NSF is cautioned against a shift in the centers' focus from long-term fundamental research to applied research focused on short-term industrial problems.

The ERC program is now in its third year of operation. Eleven centers have been started, three more are expected in FY 1987, and four of five are expected in FY 1988. The long term goal remains the establishment of 25 centers. The Committee notes that the evaluation process for the first centers established in FY 1985 is beginning and the Committee looks forward to the results of that evaluation process. The overall plan for the centers should continue to be evaluated as the assessment of the success of the existing centers are made.

The Committee supports NSF's 40 percent funding increase aimed at expanding the human resource base in innovative and emerging fields of engineering. As part of this effort, the Presidential Young Investigators program will support 85 new faculty members, the Engineering Initiation Awards program is increased from $3 to $5 million to encourage new engineering faculty members to begin research careers by providing first-time NSF support. At the undergraduate level, a high priority is to revitalize the current engineering curriculum by making it more responsive to the needs of industry and the engineering profession.

BIOLOGICAL, BEHAVIORIAL AND SOCIAL SCIENCES (BBS)

The Committee recommends a budget of $297 million for FY 1988. This is an increase of $38.9 million over the FY 1987 current plan.

The BBS program supports research on questions ranging from the fundamental bases of molecular structure and function, through the organization and function of the complex social, economic and political structures of human society, thereby promoting progress in the life sciences. Many BBS research activities are multidisciplinary, cutting across a number of scientific fields. For example, fundamental research in plant biology, for which NSF provides over 50 percent of all Federal support, includes studies of the molecular structure and function of plant cells, and is supported by both the Cellular and Molecular Biosciences Subactivities.

The Committee is interested in the expanded efforts of the NSF in the field of plant science. The requested establishment of Plant Science Centers in cooperation with DOE and USDA is strongly encouraged, particularly centers that will help in the mapping of the genome of commercially important U.S. crops such as corn and soybeans.

In the long term, the use of plants to produce nontraditional agricultural products such as chemical feedstocks and oils could be crucial to the long term economic health of agricultural areas and for United States competitiveness in many important areas. The Committee believes that a substantial increase in basic research in plant science areas that will enable us to better understand the opportunities that exist in this area is of great importance.

NSF should continue its support for significant infrastructure and research resources development and maintenance, including human resource needs, instrumentation, and sharable datasets. Currently, BBS devotes 22 percent of its total resources to activities designed explicitly to strengthen the infrastructure of its fields.

In behavioral and social sciences, NSF accounts for about 25 percent of all Federal support. NSF provides the largest share (38 percent) of support for social science basic research in colleges and universities. The Foundation is practically the sole source of support in such research areas as anthropology and political science, providing 95 percent of all Federal support for academically-based research. The Committee encourages continued solid support in these fields.

GEOSCIENCES (GEO)

The Committee recommends $330 million, an increase of $44.9 million over the FY 1987 current plan.

Established in 1986, the geosciences comprised of the atmospheric, earth, and ocean sciences are characteristically multidisciplinary and observational in nature. The major research focus in the geosciences activity is a Global Geoscience initiative, that includes programs in each of the three major research areas. This initiative began in FY 1987 with support for studies of global oceanic and atmospheric circulation; global tropospheric chemistry; exchanges of biological and chemical materials with the oceans and among atmosphere, earth and ocean; and properties of the solid earth. The

program's goals are to understand how the earth functions as a system of interrelated processes and to describe major cause and effect among these processes.

SCIENTIFIC, TECHNOLOGICAL AND INTERNATIONAL AFFAIRS (STIA)

The Committee recommends $51 million, which is an increase of $7.3 million (17 percent) over the FY 1987 current plan.

STIA's activities cut across all the scientific and engineering disciplines in the Foundation, often responding to executive and legislative mandates, as well as providing services to the science and engineering community. Specific projects in support of these responsibilities have led to numerous programmatic and scientific accomplishments. For example, support provided by one program in Research Initiation and Improvement allowed acquisition of special equipment to enable disabled individuals to more fully participate in NSF's research projects, while a project in Industrial Science and Technological Innovation produced an instrument to examine molecular structure which was judged to be one of the most important technological advances in 1985.

STIA has also initiated new activities designed to improve access by U.S. investigators to Japanese scientific and technical information and to increase participation by U.S. scientists and engineers at Japanese research institutions. The Committee recognizes the importance of international exchange between scientists and supports the NSF programs, such as the NATO-fellowships which enable U.S. scientists to obtain training in foreign countries.

COMPUTER AND INFORMATION SCIENCE AND ENGINEERING (CISE)

The Committee recommends $143 million, $26.4 million or 22.7 percent over the FY 1987 current plan.

The CISE directorate was established in 1986 with the reorganization of major computer and information sciences activities throughout the Foundation. In addition to supporting research on computing and information processing, CISE serves the overall U.S. research community by providing access to and developing very advanced computing and networking capabilities.

The Committee is pleased with the development of the Foundation's advanced scientific computing or supercomputer initiative. Begun in 1985 with the support of this Committee, the idea of providing the U.S. researchers access to state-of-the-art computational equipment has today become a reality. During the Phase I program, NSF was able to provide modest access to existing supercomputers while it solicited proposals to establish the Phase II NSF National Supercomputer Centers. Five such centers have now been established and are currently providing the academic research community with access to state-of-the-art computational equipment. NSF support for the national centers is coupled with increased support for the establishment of a national supercomputer network including Phase I centers. It is this network which will provide the academic community enhanced and efficient access to the national supercomputer centers.

The Committee supports the NSF policy to focus its support to maintain the national supercomputer centers and at the same time

encouraging the national centers to perform research to advance the state of advanced scientific computing. There may be cases, however, where a particular research project has a justifiable need for a computing capability which is not presently available at the national centers. In limited instances, NSF policy is to entertain proposals to either the supercomputer program or the individual disciplinary programs for supporting these requests. The Committee encourages NSF, in allocating its resources for supercomputing, to balance the requirement of maintaining the national supercomputer centers at the state of the art and the need to accommodate justifiable user requirements through support of the Phase I supercomputer centers or through other institutions where appropriate.

The Committee expects NSF to improve its supercomputer networking capabilities aimed at developing a national infrastructure for computer and human interaction and communication. A network (such as NSFNET) should provide easy access to research facilities over high speed communications channels, allowing rapid dissemination of data and research findings.

Support for research on parallel techniques of computing and information processing will be expanded. At least one major new research center will be initiated with a new parallel computer made available to the academic community. Research on automation, robotics, and intelligent systems will be expanded. Interdisciplinary cooperation of computer and cognitive scientists, electrical engineers and mathematics will be stressed.

PROGRAM DEVELOPMENT AND MANAGEMENT (PD&M)

The Committee recommends $95 million, an increase of 20.1 percent over FY 1987 current plan.

PD&M accounts for 5 percent of the Foundation's total FY 1988 request and provides funds for staff salaries and other operating expenses necessary to manage and administer the Foundation's program responsibilities. The Committee supports the expanded uses of automation, particularly of personal computers, which has resulted in increased productivity. Emphasis should continue on these capital expenditures to improve the Foundation's analytical capability, shorten proposal review time and reduce the administration burden. An increase of $5.9 million for capital improvements will provide first-year costs for a voice/data transmission system, and further integration of the Foundation's distributed information system. Also included in this area are funds to improve NSF's space utilization and its environment by renovations and improvements of its existing building facility.

SCIENCE AND TECHNOLOGY CENTERS

In general the Committee supports the NSF proposal to establish Science and Technology (S&T) Centers. The Committee, however, remains concerned that adequate support continue to be provided to the backbone of the academic basic research system—the individual investigator. Nevertheless, these centers will provide opportunities for interdisciplinary teams to attack paramount research issues which are important for international competitiveness. The centers are expected to accelerate scientific progress in many disci-

plines and, in some cases, may be the only way to bring multidisciplinary talents to bear on emerging, complex research topics. For example, the Committee encourages the participation of scientists in the Engineering Centers and engineers in the Science and Technology Centers as a way to foster cross-disciplinary interaction and problem solving. The centers are expected to focus on basic research. They are also viewed as a valuable resource for the education of undergraduate and graduate students, as well as the rapid transfer of knowledge and information crucial in the effort to improve economic competitiveness.

The Committee is aware that the National Academy of Sciences (NAS) has been asked by NSF to recommend guidelines for the S&T Centers program. This is similar to the advice the NSF sought from the National Academy of Engineering with respect to the Engineering Research Center program. The Committee looks forward to the forthcoming report from the NAS. The Committee believes the Foundation should provide guidance to the academic community in terms of the scope and direction of the program but the substance and disciplinary focus of the actual proposals should be left to the imagination and creativity of the university basic research enterprise. The Committee expects the merit review process will be utilized in the selection of centers to be supported and that NSF will encourage significant participation of the part of industry, National Laboratories and state and local governments will be forthcoming in the support of these centers. In addition, the Committee encourages other federal agencies to participate in the programs for S&T Centers as well as Engineering Research Centers.

UNITED STATES ANTARCTIC PROGRAM (USAP)

The Committee recommends $143 million, an increase of $25.9 million, a 22.1 percent over the FY 1987 current plan of $117.1 million.

Research support to investigators increases slightly, (8 percent) to maintain the current level of activity and to carry out selected new projects. There is a substantial increase (22.1 percent) in the activity for additions to laboratory facilities and for logistical equipment as requested in the budget proposal. NSF has been assigned responsibility by the President to budget for and manage the U.S. Antarctic Program. This program supports national goals to maintain the Antarctic Treaty, to ensure that the continent will continue to be used for peaceful purposes, to foster cooperative research contributing to the solution of regional and worldwide problems, to protect the environment, and to ensure the equitable and wise use of living and nonliving resources.

The NSF scientific research program continues to be the principal expression of United States policy which calls for the maintenance of an active and influential presence in Antarctica. To maintain that active and influential presence, the Committee endorses the necessary logistical initiatives concerning the leasing or lease-purchase option of an icebreaking research vessel and the overall effort to revitalize the NSF-owned fleet of LC–130 aircraft. These activities are vital for the Nation if it is to adequately support the research programs, especially the ozone depletion research efforts,

and maintain its mobility in this unique area of the world. However, it is the understanding of the Committee that the large FY 1988 request to replace/upgrade the logistical equipment is a one time expense and that in subsequent years the Committee expects increased emphasis on the actual research.

The major objective of the U.S. Antarctic research program is to provide for study of the physical and living environment of Antarctica. Studies focus on the solid earth, the overlying and surrounding ice, the oceans, the atmosphere, and the terrestrial and marine biota. In atmospheric sciences, Antarctica forms a unique natural laboratory for investigating the upper atmosphere, high latitude and cold climate phenomena, meteorology and solar dynamics. Ocean studies address the dynamic, paleantology, and address geology, geophysics, glaciology, and plate tectonics. These research efforts seek to relate Antarctic environmental processes to a global context. The Committee continues to support the Foundation's ongoing project of global significance, the seasonal depletion of ozone over the Antarctic.

The Antarctic Policy Group, chaired by the Department of State is responsible for providing policy guidance to the NSF regarding program content. The Polar Research Board of the National Academy of Sciences provides continuing insight on scientific opportunities and priorities.

SCIENCE AND ENGINEERING EDUCATION (SEE)

The Committee recommends $125 million, which is $25.96 million more than the FY 1987 current plan and $10 million more than the Administration's request for FY 1988. The additional $10 million should be transferred to SEE from the Research and Related Activities area. Insofar as NSF is relying on individual research directorates to carry out the Foundation's initiatives in undergraduate science and engineering education, and has targeted $68 million for this purpose, it is clearly the Committee's intent that NSF will not diminish its commitment to cross-directorate undergraduate initiatives to accomplish this transfer of funds.

Overall, the Committee recognizes the need to improve our Nation's science and engineering education at all levels. The Committee believes that there is a need for greater emphasis in the Foundation for these programs. The Foundation's budget proposes significant increases in Science and Engineering education over the next 5 years and the Committee applauds this direction. The Committee expects that in the future NSF will increase support for science and engineering education activities by a percentage which is equal to or greater than any increase requested for the aggregate Research and Related Activities categories.

The responsibility of the SEE program is to define and fund programs and projects that support educational aspects of the Foundation's mission. Throughout its activities SEE plays a major role in efforts to develop human resources for science. The Committee has recommended an additional $10 million for this activity due to the critical need to improve the science and engineering educational effort in the U.S. (and the long lead times needed for new pro-

grams, materials and methods) which requires a continuing commitment and significant involvement by the Foundation.

A. Precollege Education

The Committee recognizes the importance of precollege education in shaping the attitudes of students to science, mathematics and engineering. To encourage broader participation by women and minorities in science and engineering, precollege education plays an important role. For FY88 the Foundation proposes to spend $68 million for precollege programs such as Teacher Preparation and Enhancement and Materials Development, Research and Informal Science Education. However, due to the recognized need of improving science and mathematics education at the elementary, junior high, and high school levels the Committee recommends an additional $5 million for precollege activities, raising the total to $73 million.

The Committee urges the development of innovative public-private partnerships to improve precollege science and mathematics education. Strong involvement by state and local education groups and agencies, parents, industry, and other private groups including foundations, where appropriate, is encouraged. This new effort should bring together the programmatic elements necessary for improvements in precollege science education, including materials research, development, adaptation to local needs and dissemination; teacher training and follow-up; the use of high quality advanced technologies (hardware and software); and appropriate evaluation procedures into a comprehensive, long-term effort to improve (and assess that improvement) in local precollege settings.

The Committee believes that it would be beneficial to establish a program for Teachers Teaching Teachers. Such a program would bring together Presidential Mathematics and Science Teacher Award Winners and other pedagogic experts to work together toward the development of improved curricula and teaching methods in Math and Science Education. Such a program could improve the quality of Math and Science Education of our secondary school students.

The Committee supports the use of television and other methods of informal science education as a way of building excitement among significant numbers of young people in the area of science and technology. For example, 3-2-1 Contact and Square One, the new television series on mathematics, are well recognized for their quality and ability to encourage the interest of young people in science, mathematics, and technology. The Committee notes that in the past, the use of television as a medium for precollege science education has involved the joint efforts of both the NSF and the Department of Education. The Committee has become aware, however, that the Department may not provide support beyond the current fiscal year, and hopes that such a withdrawal will not occur.

Overall, the Committee urges greater cooperation and coordination of precollege science and mathematics programs between NSF and the Department of Education. The combination of scientific and technical expertise and expertise in teaching can contribute much to the effectiveness of science, math, engineering education and teacher training.

B. Undergraduate Education

The Committee recognizes that undergraduate education is particularly significant because it is the vital link between secondary schools and graduate education, as well as the world of work. It constitutes the primary instructional training for engineers and future scientists, and often is the only exposure to instruction in science and technology for future leaders of business, government, and the professions. The Committee endorses the Foundation's proposal to increase the funding of undergraduate education programs to $68 million ($55.5 million within the research and related directorates and $12.5 million within SEE), an increase of 127%. All of the Foundation's programmatic directorates have a role in undergraduate education since education and research priorities and needs are closely linked. The most effective educational activities will reflect the particular needs of specific disciplines. An important linkage exists between education at the undergraduate level and the research process that develops our future scientific and engineering manpower base. This makes it important that the research disciplines take the programmatic lead and be responsible for the initiation and support of activities that strengthen the Nation's undergraduate science and engineering enterprise.

Responsibility for undergraduate activities is shared among the disciplinary research activities, the Directorate for Scientific, Technological, and International Affairs, and the SEE Directorate. The Committee is pleased, however, that NSF is establishing an Office of Undergraduate Science and Engineering Education within the SEE Directorate to help coordinate the Undergraduate educational programs and to serve as a focal point for the Foundation's undergraduate activities, but cautions that responsibility for support of undergraduate programs not fall exclusively on the newly created office. Research directorates must promote undergraduate programs actively. The Committee directs the Foundation to report annually with details on the expenditure of its resources in the area of undergraduate science and engineering education.

The Foundation proposes to maintain funding of the College Science and Instrumentation Program (CSIP) at the FY 1987 level of $9.5 million. The Committee believes that additional funds are needed for improving both instrumentation and teaching laboratories at colleges. The Committee recommends that the CSIP be increased to $14.5 million for FY 1988, $5 million more than the original request. In light of the limited funding available for this program and the need to sufficiently support the most promising proposals the Committee urges the Foundation to maintain it's merit review system for these proposals.

C. Graduate Education

At the graduate level, SEE promotes the development of young scientists through the educational and research training system of the Nation. Within SEE the principle component is the NSF Graduate Research Fellowship Program. These fellowships are one of the Federal Government's most effective means of identifying excellence in science and engineering potential among its young citizens.

D. Broadening Participation in Science and Engineering

The Committee supports the Foundation's proposals such as Minority Research Initiation, Research Opportunities for Women and the Experimental Program to Stimulate Competitive Research to increase participation of underrepresented groups in science and engineering. The Committee believes that programs to broaden participation (within SEE as well as other directorates) are much needed and should continue to be strengthened.

Merit Review.—The Committee strongly endorses the merit review of all proposals awarded by the National Science Foundation. The Committee endorses the reliance of the Foundation on the judgment of qualified, experienced scientists and engineers in selecting the most promising high quality research for support. The Committee wishes to emphasize that it is essential to have broad participation of the scientific and engineering communities in the review process, including predominantly undergraduate institutions and younger faculty.

Special Foreign Currency for FY 1988.—There is no special foreign currency request from the Foundation.

SPECIAL COMMITTEE INITIATIVE

University Research Facilities Revitalization

The Committee recommends the establishment of the University Research Facilities Revitalization Program.

The Committee finds that in the past several years, there have been increasingly disturbing signs that higher educations' facilities for supporting research and engineering are deteriorating. Universities now perform over half of all federally sponsored basic research, and 13 percent of all federally sponsored R&D. Universities and colleges are also responsible for training the bulk of our future scientists, engineers, and research professionals. Consequently, the ability of our institutions of higher learning to successfully carry out these responsibilities is a matter of great concern to the Committee and the nation as a whole.

According to a recent comprehensive report of the Congressional Research Service (Brick and Mortar: A Summary and Analysis of Proposals to Meet Research Facilities Needs on College Campuses, 1987), Federally supported grants for graduate research facilities ended in 1969, while Federal support for undergraduate facilities was terminated in 1973. In addition, more than 88 percent of Federal funds for direct loans for facilities construction, renovation and repair, was appropriated prior to 1970. Further, funding for major Federal programs for construction, renovation and repair of university research facilities declined 85 percent in constant dollars between FY 1963 and FY 1984.

According to a recent NSF survey of 165 doctoral granting institutions (Science and Engineering Research Facilities at Doctorate-Granting Institutions, 1986), 89 percent of those research administrators surveyed reported that the number of research projects at their universities are limited by facilities, and 92 percent indicated that the type of research project undertaken is facilities limited. Forty-nine percent of the research administrator indicated their research facilities were in fair to poor condition, while 75 percent

stated that additional research space was more critical than repairing or upgrading existing space.

The Committee believes that NSF is uniquely qualified to successfully establish and implement a research facilities program and acknowledges that NSF did so between 1960 and 1972. Further, the Foundation has established a strong working relationship with the academic research community and private nonprofit organizations over the past 35 years, and more recently with state governments and industry. The Committee encourages such expanded partnerships.

The Committee notes the report by the White House Science Council (Packard-Bromley Report) entitled "A Renewed Partnership" which also recommends to the President that a facilities program be established within the NSF to allow U.S. universities to bring their infrastructure to an acceptable level in a timely fashion. This report further urges that facilities funding be incremental to existing R&D support levels to avoid harming an already constrained research budget. The Committee's bill is consistent with these recommendations.

The newly authorized program instructs NSF to establish and carry out a university research facilities revitalization program, under which awards are made to institutions of higher education and independent nonprofit research institutes for the repair, renovation, or replacement (as appropriate) of such institutions' obsolete laboratories and other research facilities.

The authorization stipulates that NSF may award a maximum of 50 percent of the cost of repair, renovation or replacement. The remaining costs will have to come from non-Federal sources or from the institution itself. Although the Committee has not capped the amount NSF can award to a university or nonprofit organization, the Foundation should consider previous facilities awards given to an institution in order to promote broader participation of eligible institutions. Additionally, the Committee acknowledges the fact that the facilities problem is both long and short-term in nature and urges the Foundation to balance these concerns. NSF should weigh the recommendations of various expert organizations accordingly.

The Committee strongly endorses the provision contained in the bill requiring NSF to award funds for repair, renovation or replacement of research facilities using a merit review procedure. The Committee expects any facilities awards given under this program to pass through a merit review process, with broad and equitable representation from the full spectrum of institutions of higher education included in the review process. The Committee also notes that the merit review process as traditionally practiced by the NSF may not be appropriate for a higher education facilities program. To help ensure that the limited federal funds available under this program are well spent, the Committee directs the Director of the Foundation to conduct a study to specify more precisely the process for making grant awards and the criteria employed in making these decisions. The Committee expects that the criteria will include, but not necessarily be limited to the following:

(1) The quality of research and/or training to be carried out in the facilities involved;

(2) The need for the facilities;

(3) The congruence of the institution's research activities with the research and investigator manpower needs of the nation and the research mission of the NSF;

(4) The age and condition of existing research facilities and equipment;

(5) The geographic distribution of the institution applying for funds;

(6) The implication, if any, of the proposed project for local, state or regional economic growth.

The Director shall also, as part of this planning process, describe the steps to be taken to ensure that the individuals participating in the merit review process (reviewers) are broadly and equitably representative of the full spectrum of higher education institutions.

The NSF planning process is to include "consultation with other appropriate federal agencies, institutions of higher education, state and local governments, and appropriate nonprofit organizations." A report outlining the results of this study should be submitted to the Committee on Labor and Human Resources and the Committee on Comerce, Science and Transportation of the Senate, and the Committee on Science, Space and Technology of the House of Representatives not later than March 1, 1988.

In FY 1988 the Director of the Foundation is authorized to spend up to, but not more than $1 million, from available funds to the Foundation, to conduct comprehensive planning activities necessary to implement the university research revitalization program. For FY 1989 and FY 1990 the amendment proposes to spend $47 million and $95 million respectively for this activity. For FY 91 and FY 92 the Committee authorizes "such sums as may be necessary," with the understanding that following the Foundation's study and initial assessment of the needs of institutions and the success of the program, significant increases in the funding level of the program may be warranted. However, the Committee does not intend that this authorization of funds for facilities revitalization should come at the expense of the research budget, or delay the doubling of NSF's research budget beyond FY 1992.

The Committee is concerned that there be equitable distribution of support within this program. While the support of excellence is a key mission of the Foundation, the development of research potential is also an important responsibility of the NSF. Therefore, the bill sets aside 15 percent of the amount appropriated for facilities modernization to institutions of higher education that received less than $10 million in total Federal obligations (including obligations for the university research laboratory modernization program) in each of the two preceding years. Furthermore, the bill stipulates that 10 percent of those set aside funds be reserved for institutions of higher education serving a substantial number of minority and disadvantaged undergraduate and graduate students.

V. Committee Actions

The Committee on Labor and Human Resources held a public hearing on April 9, 1987, to consider the Reauthorization of the Na-

tional Science Foundation. The following persons and organizations presented testimony for the record:

Mr. Erich Bloch, Director of the National Science Foundation.

LeRoy Lee, President, National Science Teachers' Associations.

Dr. David G. Marker, President of Cornell College, Mount Vernon, Iowa, on behalf of the Associated Colleges of the Midwest, the Great Lakes Colleges Association, Reed College, Connecticut College, and Rollins College.

Dr. Robert M. Rosenzweig, President, Association of American Universities, on behalf of the Association of American Universities, the Council of Graduate Schools in the U.S., and the National Association of State Universities and Land-Grant Colleges.

Dr. Sheila E. Widnall, President, American Association for the Advancement of Science.

Mr. Howard J. Silver, Consortium of Social Science Associations.

Mr. F. Karl Willenbrock, Executive Director, American Society for Engineering Education.

Dr. Jean E. Brenchley, President, American Society for Microbiology.

On June 3, 1987 the Committee on Labor and Human Resources met to consider an original Committee proposal for reauthorization of the National Science Foundation for Fiscal Years 1988–1992. By voice vote the Committee adopted an amendment by Mr. Dodd, establishing a University Research Facilities Revitalization Program.

The Committee subsequently ordered the amended Committee bill, favorably reported by voice vote.

VI. Congressional Budget Office Cost Estimates

U.S. Congress,
Congressional Budget Office,
Washington, DC, June 9, 1987.

Hon. Edward M. Kennedy,
Chairman, Committee on Labor and Human Resources, Washington, DC.

Dear Mr. Chairman: The Congressional Budget Office has prepared the attached cost estimate for the National Science Foundation Authorization Act of 1987.

If you wish further details on this estimate, we will be pleased to provide them.

With best wishes,
Sincerely,

Edward M. Gramlich,
Acting Director.

CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

1. Bill number: Not yet assigned.

2. Bill title: National Science Foundation Authorization Act of 1987.

3. Bill status: As ordered reported by the Senate Committee on Labor and Human Resources on June 3, 1987.

4. Bill purpose: This bill authorizes appropriations for ongoing activities of the National Science Foundation (NSF) for fiscal years 1988 through 1992. Beginning in fiscal year 1989 and continuing

through fiscal year 1992, the bill also authorizes additional appropriations for the modernization of university research facilities.

5. Estimated cost to the Federal Government:

[By fiscal years, in millions of dollars]

	1988	1989	1990	1991	1992
Estimated authorization level	1,893	2,205	2,569	2,702	2,833
Estimated outlays	881	1,870	2,314	2,591	2,744

Assuming the sums authorized in this bill are appropriated prior to the beginning of fiscal year 1988, CBO estimates that outlays in that year, including those form previous years' appropriations, would total about $1,769 million.

The costs of this bill within budget function 250.

Basis of estimate

For the purposes of this estimate, it was assumed that all funds authorized are appropriated prior to the beginning of the fiscal year and that spending will follow historical patterns. The bill states the specific authorization levels for fiscal years 1988 through 1990, while authorizing "such sums as may be necessary" for fiscal years 1991 and 1992. CBO estimates the authorization levels in those fiscal years by adjusting the fiscal year 1990 levels for projected inflation under CBO's baseline assumptions.

6. Estimated cost to State and local governments: None.

7. Estimate comparison: None.

8. Previous CBO estimates: On May 21, 1987, CBO prepared a cost estimate for H.R. 2330, the National Science Foundation Authorization Act for Fiscal Year 1988, as amended and ordered reported by the House Committee on Science, Space, and Technology. H.R. 2330 authorizing funding for the NSF for fiscal year 1988 only, at the same level as this bill. The estimated fiscal year 1988 outlays for H.R. 2330 are $5 million less than under this bill because of differences in the allocation of funds among various NSF activities.

9. Estimate prepared by: Paul M. DiNardo.

10. Estimate approved by: C.G. Nuckols (for James L. Blum, Assisant Director for Budget Analysis).

VII. Regulatory Impact Statement

In accordance with paragraph (5)(a) of Rule XXIX of the Standing Rules of the Senate, the following statement of regulatory impact of S. 1632 is made.

This measure respresents a 5 year extension of existing NSF programs and activities, establishes a university facilities revitalization program and proposes specific levels of funding for these programs and activities. There is no additional regulation or paperwork burden anticipated as a result of the enactment of this legislation.

VIII. Section-By-Section Analysis

Section by section analysis of the NSF reauthorization act.

Title I: National Science Foundation Authorizations:

Section 101:

(a) Specifies the Committee's desire to strengthen the National Science Foundation

(b) Authorizes specific levels of funding for each of NSF's research and education activities for FY88. Authorizes a specific level of funding for FY89 and for FY90. Authorizes such sums as may be necessary for FY91 and FY92.

(c)(1) Specifies that from the amounts set forth in categories (a) through (f) of subsection 101(b), $10,000,000 shall be transferred to category (h) relating to Science and Engineering Education, to increase the Foundation's pre-college programs and college instrumentation programs by $5,000,000 each.

(2) Specifies that in the fiscal years FY89–FY92, the budget for Science and Engineering Education shall increase by at least the percentage by which the aggregate budgets for categories (1) (a–g) increase over the previous fiscal year.

102. Specifies that the appropriations made for the programs in section 2 shall remain available for obligation for periods specified in the appropriations acts.

103. Limits the amount of funds available for official consultation representation or other extraordinary expenses to $7,500 per fiscal year. These expenditures are made at the discretion of the Director of the Foundation.

104. (a) Authorizes the director to transfer funds among the categories in section 101(b), so long as the funds transferred do not reduce or increase the amounts authorized in section 101(b) by greater than 10 percent.

(b) Requires the Director to notify the Senate Committee on Labor and Human Resources, Senate Committee on Commerce, Science and Transportation, and the House Committee on Science, Space, and Technology if a proposed transfer of funds exceeds 10 percent. The proposed transfer may only take place 30 calendar days after written notification and assuming that there are no objections.

105. Makes several changes to the National Science Foundation Organic Act of 1950.

Title II: University Research Facilities Revitalization:

201. Short Title.

202. Statement of findings of the need for University facilities revitalization, to enable continued progress in scientific and engineering research and education, and to maintain a leading position in the frontiers of science and in economic productivity and competitiveness.

203. (a) States the purpose of the program.

(b) Establishment of the program.

(c) States the types of projects and funding guidelines for the program.

(d) Specifies four criteria which shall be included in the awarding of funds to any institution for a project under this university research facilities program.

204. Requires consultation of the Director of the National Science Foundation with other agencies of the Federal Government concerned with research for the purpose of prescribing regulations and conducting the program authorized by this title.

205. (a) Authorizes the Director of the National Science Foundation to conduct comprehensive planning activities for program implementation.

(b)(1) Requires the Director of the Foundation to conduct a comprehensive study on the roles and responsibilities of various government and non-government entities in support of facilities revitalization.

(2) Requires the Director to prepare and submit a report on this study to the appropriate Congressional Committees by March 1, 1988.

(c) Authorizes funds to carry out the provisions of this section.

(206). (a) Authorizes funds for the program for fiscal years 1989–1992.

(b)(1) Specifies that at least 15% of the amounts appropriated in subsection (a) be available to institutions of higher education that receive less than $10,000,000 in total Federal obligations.

(2) Specifies that at least 10% of the funds appropriated in subsection (a) be reserved for institutions of higher education serving a substantial number of minority and disadvantaged students.

IX. Changes in Existing Law

In compliance with rule XXVI paragraph 12 of the Standing Rules of the Senate, the following provides a print of the statute or the part or section thereof to be amended or replaced (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italic, existing law in which no change is proposed is shown in roman):

National Science Foundation Act of 1950

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NATIONAL SCIENCE BOARD

Sec. 4. * * *

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(j)(1) The Board shall render to the President, for submission to the Congress no later than January 15 of each even numbered year, a report on indicators of the state of science and engineering in the United States.

(2) The Board shall render to the President for submission to the Congress reports on specific, individual policy matters related to science and engineering and education in science and engineering, as the Board, the President, or the Congress determines the need for such reports.

(k) Portions of Board meetings in which the Board considers proposed Foundation budgets for a particular fiscal year may be closed

to the public until the President's budget for that fiscal year has been submitted to the Congress.

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EXECUTIVE COMMITTEE

[SEC. 7. (a) There shall be an Executive Committee on the Board (referred to in this Act as the "Executive Committee"), which shall be composed of five members and shall exercise such powers and functions as may be delegated to it by the Board. Four of the members shall be elected as provided in subsection (b), and the Director ex officio shall be the fifth member and the chairman of the Executive Committee.

[(b) At each of its annual meetings the Board shall elect two of its members as members of the Executive Committee, and the Executive Committee members so elected shall hold office for two years from the date of their election. Any person, other than the Director, who has been a member of the Executive Committee for six consecutive years shall thereafter be ineligible for service as a member thereof during the two-year period following the expiration of such sixth year. For the purposes of this subsection, the period between any two consecutive annual meetings of the Board shall be deemed to be one year.

[(c) Any person elected as a member of the Executive Committee to fill a vacancy occurring prior to the expiration of the term for which his predecessor was elected shall be elected for the remainder of such term.

[(d) The Executive Committee shall render an annual report to the Board, and such other reports as it may deem necessary, summarizing its activities and making such recommendations as it may deem appropriate. Minority views and recommendations, if any, of members of the Executive Committee shall be included in such reports.]

SEC. 7. The Executive Committee of the Board shall be composed of the Director ex officio, who shall chair the Committee, and at least four other Board members elected by the Board. The Executive Committee shall exercise such powers and functions as may be delegated to it by the Board.

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SECURITY PROVISIONS

SEC. 15.* * *
(c) [Repealed.]

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SCIENCE AND ENGINEERING EQUAL OPPORTUNITIES ACT

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COMMITTEE ON EQUAL OPPORTUNITIES IN SCIENCE AND ENGINEERING

SEC. 36. * * *

(b) [Each member of the Committee shall be appointed by the Director with the concurrence of the National Science Board. The Chairperson of the National Science Board Committee on Minorities and Women shall be an ex officio member of the Committee. Members of the Committee shall be appointed to serve for a three-year term, and may be reappointed to serve one additional term of three years.] *Each member of the Committee shall be appointed by the Director of the National Science Foundation. Members shall be appointed to serve for a three-year term, and may be appointed for an additional term of three years.*

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(f) [Each year the Committee shall prepare and transmit to the Director a report concerning its activities during the previous year and its proposed activities for the next year. The Director shall transmit to Congress the report, unaltered, along with comments.] *Every two years, the Committee shall prepare and transmit to the Director a report on its activities during the previous two years and proposed activities for the next two years. The Director shall transmit to Congress the report, unaltered, together with such comments as the Director deems appropriate.*

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